

Allowable Subject Matter

Applicant thanks the Examiner for indicating that claims 1-7 are allowed.

Applicant thanks the Examiner for indicating that claims 18 and 19 would be allowed if rewritten in independent form. Applicants note that claims 18 and 19 are in independent form. Thus, it is believed that these claims should simply be indicated as “allowed,” and this is respectfully requested.

Applicant thanks the Examiner for indicating that claims 11, 12 and 27-36 would be allowed if rewritten in independent form. Regarding claims 11, 12, 28, 30, 32, 34 and 36, Applicant respectfully requests that the Examiner hold in abeyance such rewriting until the Examiner has had an opportunity to reconsider (and withdraw) the prior art rejection of the other claims. Regarding claims 27, 29, 31, 33 and 35, Applicant notes that these claims depend directly from allowed claim 1. Thus, it is believed that these claims should simply be indicated as “allowed,” and this is respectfully requested.

Claim Rejections

The Examiner has rejected claims 8, 9, 10, 13, 14, 15, 16, 17, 20 and 21 under 35 U.S.C. § 103(a) as being unpatentable over *Gamst* (US 4,134,547; hereinafter “*Gamst*”) in view of *Klosterman et al.* (US 4,787,404; hereinafter “*Klosterman*”). This rejection is respectfully traversed.

As discussed in Applicant’s previous response, *Gamst* discloses (see FIG. 1) a high-pressure jet pipe for cleaning “workshop premises and other large rooms” (col. 1, lines 16-17), which is composed of inlet pipe 1 and outlet pipe 2. Outlet pipe 2 has a varying shape in cross section, as shown by conically converging portion T, straight portion X, and conically diverging

portion Y. The diameters of converging portion T and diverging portion Y vary linearly in cross section, as clearly shown in FIG. 1. Compressed air is pumped into annular chamber 6 and exits through slit opening 7 to mix with water pumped through venturi nozzle 8, and the mixture then passes through converging portion T, straight portion X, and diverging portion Y of outlet pipe 2, and is further accelerated. Inlet pipe 1, outlet pipe 2, annular chamber 6, slit opening 7 and venturi nozzle 8 are all arranged linearly (and coaxially) along *Gamst's* jet pipe.

In contrast to the high pressure system of *Gamst*, *Klosterman* discloses a low-pressure and low flow rate atomizer device (col. 1, lines 6-10) composed of air inlet chamber 15 arranged at a right angle to a syringe type (col. 2, line 13) liquid injection tube 11 to form a "T" shape. The small diameter liquid injection tube 11 is coaxially arranged within a much larger diameter gas acceleration tube 12, which maintains that common diameter along its entire length. The atomized liquid is applied to work surface 14 after passing through gas acceleration tube 12.

Thus, the outputs and basic configurations of *Gamst* and *Klosterman* are clearly very different.

There Would Have Been No Motivation To Modify Gamst In View Of Klosterman

Due to these drastic differences, Applicant respectfully submits that one of skill would not have looked to *Klosterman* to modify *Gamst*. Further, Applicant respectfully submits that the Examiner's position that it would have been obvious "to have modified the device of *Gamst* by providing air injection at a higher velocity than [sic] that of the water as taught by *Klosterman et al.* to break up the cleaning liquid into droplets and to accelerate them," is unsupported.

Specifically, the Examiner must "show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select

the elements from the cited prior art references for a combination in the manner claimed.” *In re Rouffet*, 47 USPQ2d 1453 (Fed.Cir. 1998). The mere fact that references can be “combined or modified does not render the resultant combination [or modification] obvious unless the prior art also suggests the desirability of the combination [or modification].” *In re Mills*, 916 F.2d 680 (Fed.Cir. 1990); MPEP §2143.01.

Here, the usage of air at a higher velocity than a liquid is distinctly related to the specifically disclosed function of *Klosterman* as a low-pressure atomizer. There is no teaching or suggestion in *Klosterman* that the usage of air at a higher velocity than a liquid would be appropriate in the high pressure jet pipe of *Gamst*.

Further, the Examiner has not explained how *Gamst* could have been modified in view of *Klosterman*. Specifically, *Klosterman* discloses a device that utilizes a (relatively) small diameter liquid injection tube 11 arranged within a (relatively) large diameter gas acceleration tube 12 that provides air at a higher velocity than the liquid to form a low-pressure atomized flow.

However, *Gamst* is arranged directly oppositely to *Klosterman*, as a (relatively) large diameter venture nozzle 8 that provides water is arranged within a (relatively) small thickness slit opening 7 that provides air.

Klosterman fails to teach or suggest the provision of air at a higher velocity than water would be useful (or possible) in any other system than *Klosterman*’s specific low pressure arrangement. Thus, one of skill in the art at the time of the invention would not have been motivated to simply provide air at a higher velocity in *Gamst*, as the Examiner seems to allege. Rather, if for some reason the provision of air at a higher velocity would have been desired, one

of skill would have utilized *Klosterman's* specific arrangement of features (*i.e.*, relatively small diameter liquid injection tube and relatively large diameter gas acceleration tube 12), not *Gamst's*.

However, one of skill would not have been motivated to completely modify *Gamst* to provide the arrangement of *Klosterman*, as it has long been held that “if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) MPEP § 2143.01

Additionally, even if it could somehow be established that one of ordinary skill would somehow have been motivated to modify *Gamst* in view of *Klosterman*, Applicant respectfully submits that even the resultant combination would fail to teach or suggest all of the features recited in rejected independent claims 1, 8 or 15.

Independent Claim 8

Applicant respectfully submits that neither *Gamst* nor *Klosterman*, nor any reasonable combination thereof, teaches or suggests *at least* a cleaning nozzle “whereby a gas is ejected from said gas injection port at a speed higher than that of a cleaning liquid from said cleaning liquid ejection port to transform the cleaning liquid into droplets and to accelerate them.”

Specifically, *Gamst* discloses a slit opening for air coming from the inlet 3 that is located outside and directly opened to the venture nozzle 8 for water so that the air stream is poured into the water stream. Accordingly, air bubbles are formed in the water stream by this arrangement,

which is opposite to the claimed transformation of cleaning liquid into droplets. *Klosterman* fails to correct this deficiency.

Additionally, Applicant respectfully submits that neither *Gamst* nor *Klosterman*, nor any reasonable combination thereof, teaches or suggests *at least* “an ejection nozzle portion having a minimum diameter portion and a trumpet-shaped portion formed by a curved surface located upstream of said minimum diameter portion, an inclination angle of a tangent to the curved surface progressively decreasing toward said minimum diameter portion,” as recited in claim 8.

As an initial matter, Applicant notes that the Examiner has not anywhere specifically indicated what particular portion of the jet pipe of *Gamst* he believes discloses a “trumpet-shaped portion formed by a curved surface.” Thus, Applicant is left to guess as to the Examiner’s intentions.

Further, the Examiner has not responded to Applicant’s clear traversal of the Examiner’s allegation. Applicant has pointed out that only linearly varying surfaces are shown in any portion that could be considered a trumpet shaped portion (such as conically converging portion T) of the “jet pipe” shown in FIG. 1 of *Gamst*.

Additionally, Applicant respectfully submits that *Klosterman* fails to provide the features missing from *Gamst*, as *Klosterman* fails even to disclose a “trumpet shaped portion.”

Thus, Applicant respectfully submits that independent claim 8 is patentable over the applied references. Further, Applicant respectfully submits that rejected dependent claims 9, 10, 13 and 14 are allowable, *at least* by virtue of their dependency.

Additionally, Applicant respectfully submits that *at least* claim 14 is separately patentable over the applied references, and that the Examiner’s interpretation of this claim as one

of intended use is incorrect. Specifically, claim 14 recites that “a powder material can be supplied to an upstream side of said gas ejection port.” Accordingly, claim 14 recites the proposition that the cleaning nozzle is capable of use with a powder material, not how the cleaning nozzle will be used.

Further, the applied references fail to teach or suggest any provision for such powder. Thus, Applicant respectfully submits that claim 14 is allowable over the applied references.

Independent Claim 15

Applicant respectfully submits that neither *Gamst* nor *Klosterman*, nor any reasonable combination thereof, teaches or suggests *at least* a cleaning nozzle “whereby a gas is ejected at a higher speed than that of a cleaning liquid to transform the cleaning liquid into droplets.”

Specifically, *Gamst* discloses a slit opening for air coming from the inlet 3 that is located outside and directly opened to the venture nozzle 8 for water so that the air stream is poured into the water stream. Accordingly, air bubbles are formed in the water stream by this arrangement, which is opposite to the claimed transformation of cleaning liquid into droplets. *Klosterman* fails to correct this deficiency.

Additionally, Applicant respectfully submits that neither *Gamst* nor *Klosterman*, nor any reasonable combination thereof, teaches or suggests *at least* “a converging-diverging nozzle portion having a minimum diameter portion and a trumpet-shaped portion formed upstream of said minimum diameter portion,” as recited in claim 15.

As an initial matter, Applicant notes that the Examiner has not anywhere specifically indicated what particular portion of the jet pipe of *Gamst* he believes discloses a “converging-diverging nozzle.” Thus, Applicant is left to guess as to the Examiner’s intentions.

Further, the Examiner has not responded to Applicant's clear traversal of the Examiner's allegation that *Gamst* discloses a "converging-diverging nozzle." In contrast, the nozzle of *Gamst* has a conically converging section T and a conically diverging section Y separated by a constant diameter section X. This separation of the respective converging and diverging portions results in a nozzle that is not "converging-diverging." For an illustrative, non-limiting *example* of a "converging-diverging nozzle," see FIG. 13 of the Application.

Additionally, Applicant respectfully submits that *Klosterman* fails to provide the features missing from *Gamst*, as *Klosterman* discloses only a constant diameter gas acceleration tube 12.

Thus, Applicant respectfully submits that independent claim 15 is patentable over the applied references. Further, Applicant respectfully submits that rejected dependent claims 16, 17, 20 and 21 are allowable, *at least* by virtue of their dependency.

Additionally, Applicant respectfully submits that claim 21 is separately patentable over the applied references for the same reasons discussed above with respect to claim 14.

Thus, Applicants respectfully request that the Examiner withdraw this rejection.

Conclusion

In view of the foregoing, it is respectfully submitted that claims 1-21 and 27-36 are allowable. Thus, it is respectfully submitted that the application now is in condition for allowance with all of the claims 1-21 and 27-36.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Please charge any fees which may be required to maintain the pendency of this application, except for the Issue Fee, to our Deposit Account No. 19-4880.

Respectfully submitted,



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